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ABSTRACT

As the Web is expanding, the Web traffic is changing, and so are the users. To get an adequate understanding of the Web as a medium, it is of paramount importance to know the users and the dominant usage patterns. The purpose of this paper is to map important aspects of Web usage patterns, Web traffic and Web search behavior. Issues dealt with are, among other things, time spent per month, number of sessions per month, time spent during surfing session, page viewed per session and per month, duration of page viewed, number of unique sites visited, concentration of and the recent developments in Web traffic, given sites' shares of total page views, and significant aspects of Web users' search behavior (for example, frequency, time spent searching, kind of information searched for, most popular search terms, and satisfaction). (Contains 16 references.) (Author)

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New Trends in Web Usage Patterns and Web Traffic

Abstract: As the Web is expanding, the Web traffic is changing, and so are the users. To get an adequate understanding of the Web as a medium, it is of paramount importance to know the users and the dominant usage patterns. The purpose of this paper is to map important aspects of Web usage patterns, Web traffic and Web search behavior. Issues dealt with are, among other things, time spent per month, number of sessions per month, time spent during surfing session, page viewed per session and per month, duration of page viewed, number of unique sites visited, concentration of and the recent developments in Web traffic, given sites' shares of total page views, and significant aspects of Web users search behavior (e.g., frequency, time spent searching, kind of information search for, most popular search terms, satisfaction etc.).

[If you read this file from the screen, please choose the 'Page Layout'-option in the View-menu to view the figures and charts. The final version of the paper will include updated figures and graphs for the year 2002.]

In the paper "Mapping the Web. A Media Typology for Information Traffic Patterns on the Internet Highway" (Jensen, 1996) I delineated a basic typology for information traffic patterns and media types on the Internet; in the paper "WWW - Who? Where? Why?" I outlined a media sociological analysis of demographics, consumer trends and content trends on the Web (Jensen, 2000a); and in "Trends in interactive Content & Services on the Web" (Jensen, 2000b) I summarized seven major new trends concerning content and services on the Web. In the context of this paper, I want to proceed with this line of action and sketch a number of new trends in Web usage patterns, Web traffic and users search behavior.

The Internet is growing fast. According to Inktomi there are now more than one billion unique documents on the Internet. The total number of servers is well over 6 million. And the total number of users surpassed the 400 million mark in 2000 and will continue to grow exponentially in the years to come. As the Internet and the Web are expanding, the content is changing too, and so are the users. To achieve an adequate understanding of the Web as a medium, it is of paramount importance to know the users and to understand the dominant Web usage pattern.

The purpose of this paper is to track changes in the Internet: to map Web usage patterns and Web traffic, thereby establishing an understanding of the new Web user. Due to limited space, among other things, this study will focus only on three aspects:

- Web Usage Patterns
- Web Traffic
- Web Search Behavior

Web Usage Patterns

Figures on average Web usage from Nielsen/NetRating from the last couple of years show that the total time spent per month on the Web has gone down lately and that it

ED 479 557

IR022163

seems to stabilize around 10 hours per month. At the same time the number of pages viewed in a month and the number of page views in a session is going up. Consequently, the duration of a page viewed is going down.

Table 1 shows the growth in time spent per month over the last year and a half. From 7:34:28 (hr:min:sec) in July 1999, 9:26:51 in January 2000, to a height of 10:04:05 in October 2000, the time spent per month has now fallen to 9:37:25 (February 2001). Thus, it seems as if the time spent per month on the Net has stabilized just below 10 hours per month.

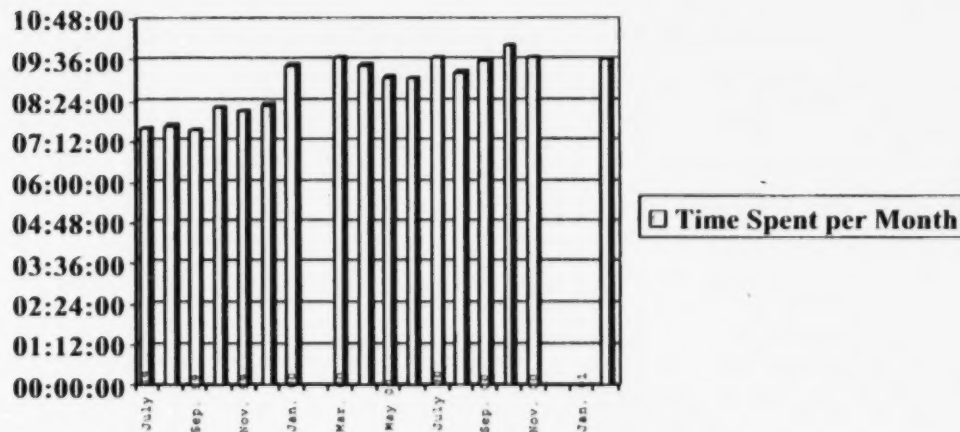


Figure 1: Time Spent per Month [Nielsen//NetRatings 1999, 2000, 2001, The reported Internet Usage estimates are based on a sample of households that have access to the Internet and use platforms such as Windows 95/98/NT and MacOS8 or higher]

Likewise, the figures estimate that the number of sessions per month is down to 18. From an average of 16-17 sessions per month in 1999, and an average of 18-19 sessions per month in 2000, the number seems to have stabilized around 18 sessions per month in the recent period (cf. Table 2).

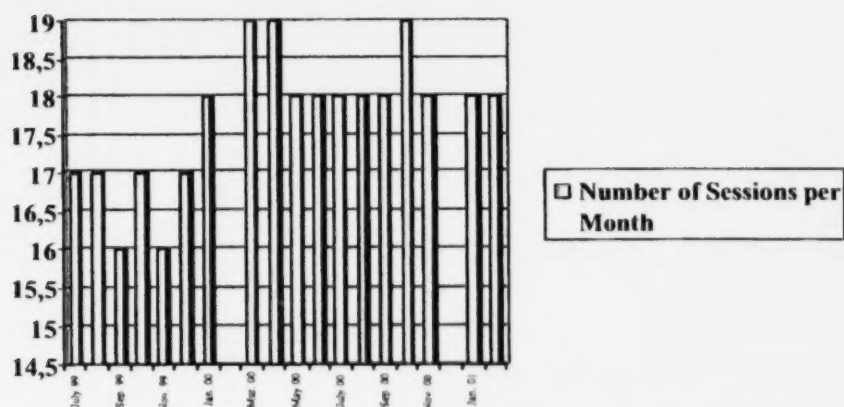


Figure 2: Number of Sessions per Month

The average time spent during a surfing sessions has been steadily increasing from 26:44 (min:sec) in July 1999 to 32:22 in February 2001. However, over the last year or so, the figures have been rather stable.

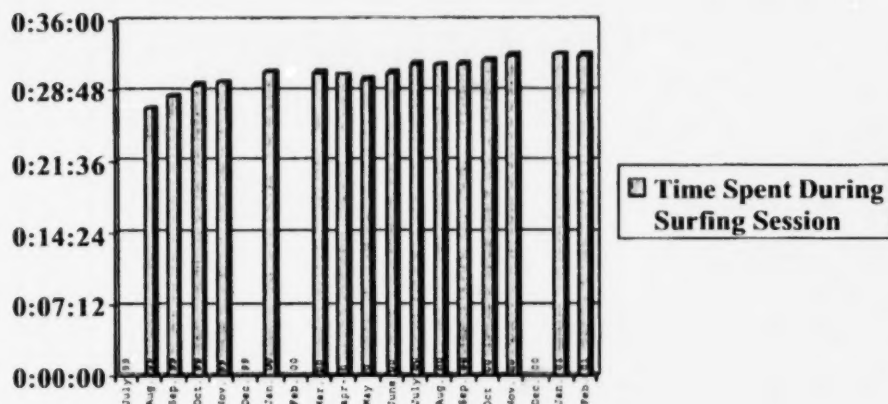


Figure 3: Time Spent During Surfing Session

Figures, which seem to be constantly increasing, concern the number of pages viewed per session and the number of pages viewed per month. Concerning the number of pages viewed per session, it has gone up from 20 pages in July 1999 to a height at 41 pages in August 2000, falling again to 38 in the fall of 2000. (It has not within the deadline of this preliminary paper been possible to get the data from Q4, 2000 and

Q1, 2001. They will, however, including the new data from Q2 and Q3, 2001, appear in the final version of the paper.)

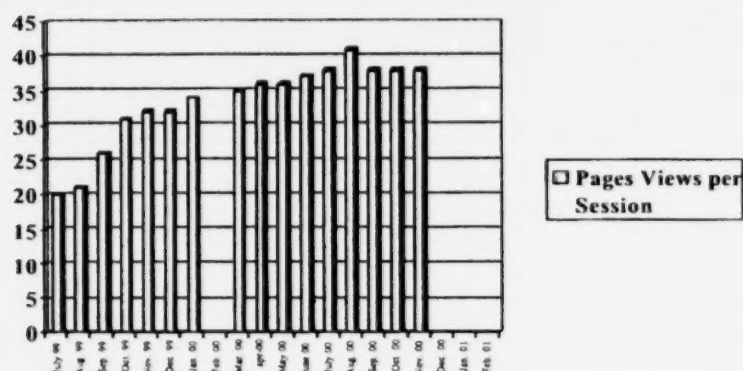


Figure 4: Pages Views per Session

Correspondingly, concerning the number of pages viewed per month, it has grown from 332 in July 1999 to 720 in October 2000 and 689 in September 2000. Thus, the number of pages viewed per month has more than doubled in a year. (It has not within the deadline of this preliminary paper been possible to get the data from Q4, 2000 and Q1, 2001. They will, however, including the new data from Q2 and Q3, 2001, appear in the final version of the paper for the proceedings.)

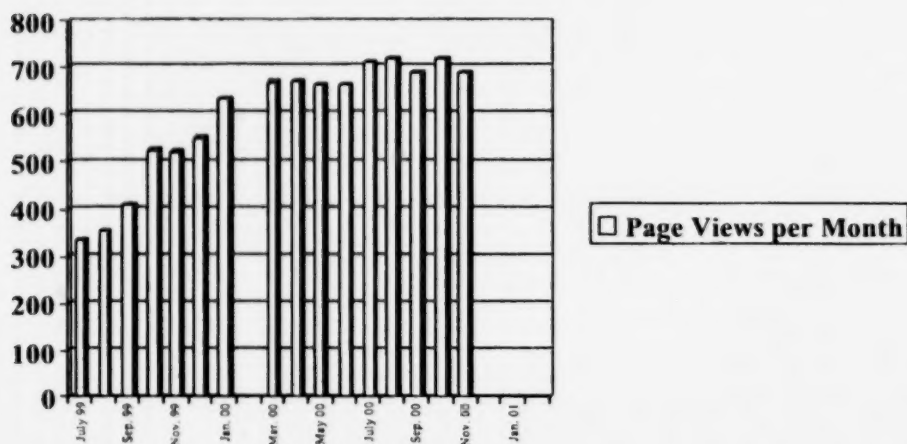


Figure 5: Page Views per Month

Following from the above, the duration of a page viewed has gone down. From an average of 1 minute and 20 seconds per page in July 1999 the duration has now stabilized around 50 seconds (February 2001).

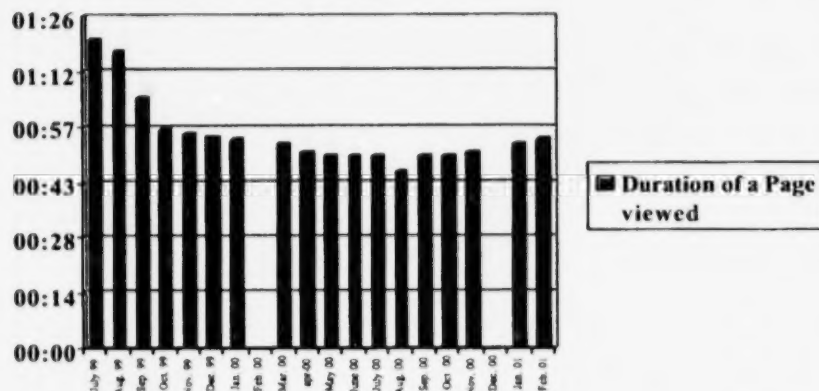


Figure 6: Duration of a Page Viewed

The average number of unique sites visited in a month is down to 10 and this figure seems to be one of the most constant. While the number of unique sites visited was around 12 in July-August 1999 it has been fixed on 10 sites the last year or so. This indicates that irrespective of how many sites there are on the Web, users tend to find their favorites and stick with them. That is, users are beginning to show loyalty to a limited number of sites: The Internet surfers are turning into Internet settlers. Each user has preferences for and loyalty to Web sites they visit.

Coincidentally, this number of unique sites visited is comparable to the number of channels actually viewed in a TV household. While the number of channels and viewing options available in the average TV home continues to grow, the number of channels actually viewed in the average household has not grown beyond 13 (Nielsen Media Research 1999).

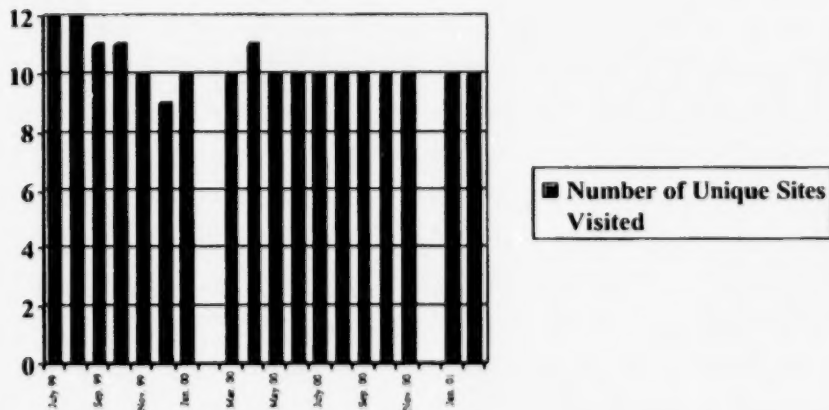


Figure 7: Number of Unique Sites Visited

Web Traffic

Although the Web is enormous there is still a significant concentration as regards content and Web traffic. In 1999, OCLE Research reported that the largest 25.000 sites represented 50 percent of all available content on the Web. Likewise, in 2000 Netcraft reported that 80 percent of all traffic on the Web ends up at only 0,5 percent of all URLs, corresponding to approximately 15.000 URLs.

Although Web traffic, as these figures indicate, is highly concentrated, a new survey by Alexa Research reports that the Web has become more dispersed in the past seven months. Based on a comparison of Web traffic in June 2000 contra January 2001, the study shows

- that the top 10 sites accounted for 11 percent fewer page views in January 2001 than they did in June 2000, i.e., the Web was 11% less concentrated in January compared to June
- that the top 100 sites accounted for 12.2 percent fewer page views in January 2001 than they did in June 2000, i.e., the Web was 12.2% less concentrated in January than it was in June
- and that the top 1000 sites accounted for 9.4 percent fewer page views in January 2001 than they did in June 2000, i.e., the Web was 9.4% less concentrated in January as compared to June

Looked at from another perspective, we could say that, in January 2001,

- 1 in 6 (16.6%) page views occurred at one of the top 10 sites
- nearly 3 in 10 (29.6%) pages was viewed at one of the top 100 sites
- and nearly half (48.3%) of all pages viewed on the Web was viewed at one of the top 1,000 sites.

All the above -mentioned figures are down from June, designating a less concentrated distribution of page views across the Web (cf. Table 1).

The Top...	% of all page views in June 2000	% of all page views in January 2001	% dilution b/w June & Jan.
10 sites	18.6 %	16.6 %	11.0 %
100 sites	33.7 %	29.6 %	12.2 %
1000 sites accounted for	53.3 %	48.3 %	9.4 %

Table 1: Top Sites Percentage of all Page Views

Thus, the top sites' share of overall Web traffic is being watered-down. In this way the Web is becoming more distributed, more equalized and balanced, and perhaps even more democratic. And yet, the majority of all Web traffic is still ending up on a very small part of the millions of sites on the Web.

An alternative way of indicating the reduced concentration of Web traffic is to contrast the number of sites that accounted for a certain share of the total page views in June and January (cf. Table 2)

Of the total pages viewed on the Web ...	Number of Sites in June 2000	Number of Sites in January 2001	% Change in No. of Sites
1 in 5	13	21	61.5 %
1 in 4	27	50	85.2 %
1 in 3	95	169	77.9 %
1 in 2 occurred at the top	695	1,210	74.1 %

Table 2: The Number of Sites that Accounted for a Given Share of Total Page Views in June Versus January

This means that, in June 2000, 13 sites accounted for 1 of every 5 pages viewed on the Web. In January 2001, that number grew to 21, which means an additional 8 sites or 61.5% more sites shared that fifth of the web. Likewise, in June 2000, 27 sites represented 1 of every 4 page views, whereas that number was up to 50 in January 2001, meaning that 85.2% more sites shared that fourth of the web. Finally, in June 2000, 695 sites accounted for half of all Web traffic, whereas in January 2001, 1,210 sites shared that half, signifying that 74.1 % more sites shared half of the Web.

A final indication of the more dispersed Web traffic is that a larger collection of sites is showing high counts of visitors. Whereas only four sites had more than one billion page views in June 2000, that number had grown to 17 sites in January 2001.

However, despite this decreasing concentration of Web traffic, the leading sites are still attracting the lion's share of all page views.

Conclusions

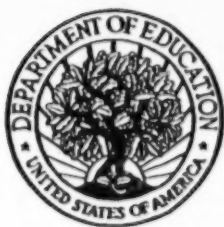
This study shows, among other things,

- that the Web is changing and so are the Web traffic and Web usage patterns
- that the total time spend per month on the Web is going down but, at the same time, that the number of pages viewed in a month and the number of pages viewed in a session is going up, and, consequently, that the duration of a page viewed is going down
- that the number of unique sites visited in a month is down to 10 and this figure seems to be relatively constant
- and that Web traffic is highly concentrated, but that the Web has become more dispersed in the past months.

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